Fundación Ceibal

Innovative Experiences 2022

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Introduction

The 2022 edition of the NODO Awards is the second edition of the event, a joint initiative of the Ministry of Education and Culture (MEC), the National Administration of Public Education (ANEP) and Ceibal. The main purpose of the project is to celebrate pedagogical innovation and draw attention to the people involved in it by sharing their experiences.

The core idea driving this stimulus is to recognize and highlight projects and schools that stand out for their most creative pedagogical proposals.The awards, which has the support of the Uruguayan Chamber of Information and Communication Technologies companies (CUTI), the Ceibal Foundation, the Technological University of Uruguay (UTEC) and VisitEDUFinn, seek to identify the most innovative projects implemented in schools and recognize their impact on improving learning. They are a stimulus for education communities as leaders in pedagogical innovation.

Through this publication, the Ceibal Foundation – the institution that supported mec, ANEP and Ceibal in the design of the Nodo Awards – presents the systematization of the winning experiences for the purpose of publicizing them and making them a source of inspiration for the whole education community in Uruguay. This document is complemented by the audiovisual record of the experiences in the form of a documentary to draw attention to those involved and their significance[1].

This time, the NODO Awards were awarded in three categories: *Pedagogical Innovation*, which contemplates transformative experiences for better learning; *Skills-Based Work*, which focuses on communication, collaboration, creativity, character, citizenship and critical thinking skills, which are necessary for sharing knowledge, and *The Public's Recognition*, based on the people's vote.

The 2022 call drew 145 project submissions from 91 schools across the country, 131 of which were state-run institutions. The distribution of the proposals by education subsystem was: 47% General Directorate of Early Childhood and Primary Education (DGEIP), 32% General Directorate of Secondary Education (DGES), 16% General Directorate of Vocational and Technical Education – UTU (DETP) and 5% Teacher Training Council (CFE). The selection of the winning projects involved an inter-institutional jury – specially convened for the occasion – and the general public.

This publication presents a systematization of the award-winning innovative experiences for the purpose of drawing attention to the leaders of the innovation processes and showcasing their work, which is necessarily collective and collaborative.

1 https://fundacionceibal.edu.uy/en/proyectos/systematizing-innovative-experiences-nodo-awards/

2022 Winners

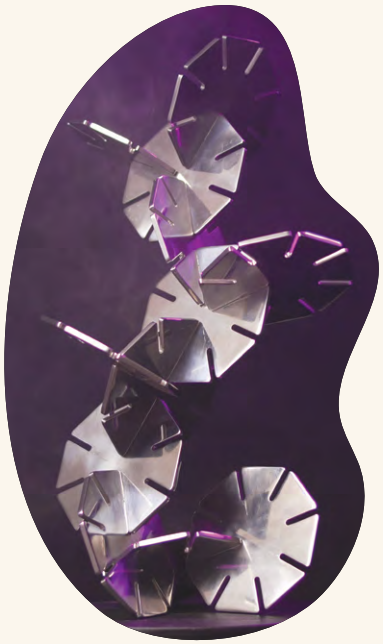
In the *Pedagogical Innovation* category, the project "Learning in order to really learn" by Nelson Mandela Associated School 183 in Montevideo won first prize. This school has reorganized teaching practices and enhances the continuity of students' educational trajectories by promoting project-based learning and the use of the digital tools of the Ceilab Programme. It promotes interdisciplinary teacher teams and prioritizes partnerships with families and the community with excellent outcomes.

The *Competency-Based Work* award went to Fray Marcos Secondary School Nº1, Florida, for "Backpack CIT". This project challenges students of different levels to research, plan and lead environment-related activities in Science, English and Technologies so that they can undertake them with students from nearby rural primary schools. In the process, communication skills necessary for sharing knowledge are developed, scientific methodology is strengthened, and secondary schoolchildren are familiarized with secondary school.

In the *Public's Recognition* category, the award was won by the AmigoL5 project of Secondary School Nº5 in Salto. The award-winning initiative involved the design and development of an application available throughout the country that interprets to and from Spanish and Uruguayan Sign Language. It arose from the identification of communication barriers in the school that hindered the participation of deaf students. The project brings together the work of students of various generations, teachers and the deaf community in Salto.

The winners of the three core categories received the "NODO Award" statuette, created by Uruguayan artist Santiago Dieste based on a conceptual design where all the pieces are interlocked and support the previous ones in a fashion akin to that of the education system. The players have the same weight, they are equals, even if they play different roles in a system that must work collaboratively. The winners also had access to postgraduate training opportunities in specialization in educational technologies at the UTEC (Spanish acronym for Technological University of Uruguay). In addition, 10 teachers from the award-winning projects in the categories of Pedagogical Innovation and Skills-Based Work participated in the STEP 2023 International Forum on Education in Helsinki, Finland, and 4 teachers from the winning project in the The Public's Recognition category travelled to the "Buenos Aires Book Fair" in Argentina.

Honourable mentions were also awarded for pedagogical creativity. Two examples are the projects "Bioquimichef 2022", submitted by Alberto Candeau Secondary School, of Canelones, and "Mineros de la luz", by Primary School N° 43 in Artigas.



Pedagogical Innovation:

LEARNING IN ORDER TO REALLY LEARN

Nelson Mandela Associated School Nº183, Montevideo

Pedagogical Innovation:

LEARNING IN ORDER TO REALLY LEARN

Nelson Mandela Associated School No. 183 was honoured with the NODO 2022 Award in the Pedagogical Innovation category for contributing to the consolidation of a strong, committed institutional culture in collaboration with the community based on a quality educational programme focusing on the student body.

The winning project, "Learning in order to really Learn", positions students as genuine leaders of the process and allows them to make sense of what they learn and come up with solutions to real-life problems, with technology as a crosscutting tool for the development of skills.

Characteristics **of the school**

Nelson Mandela Associated School No. 183 belongs to the General Directorate of Vocational and Technical Education. It is located in *Carrasco Norte*, a neighbourhood in the northeast of the city of Montevideo, an urban area with no institutional planning and with a highly heterogeneous population in socioeconomic terms. The school has a strong territorial and inter-institutional character since it has been part of the Carrasco Norte network since 2018.

In 2017 it began to operate on the same premises as Primary School No. 183 Carrasco Norte, and in 2018 it opened its own facilities with groups of the first two years of Basic Integrated Education in Technology (formerly Lower Secondary Education in Technology). The design of the building is characterized by a modular structure based on containers with eaves, with two large blocks joined by an exterior gallery. "Living roofs" optimize thermal and acoustic insulation and are in harmony with a natural environment enriched by the planting of native trees.

The staff is made up of a coordinator who has been in the role since 2018, two teacher assistants (morning and intermediate), three administrative clerks and thirty teachers. It is a highly stable team, as 75% of them have been in the institution since 2018.

The school has 160 students distributed into six groups, 2 per each of the three levels of the educational stage. It is attended by adolescents with a high level of vulnerability along with others from more favourable backgrounds.

Characteristics **of the project**

Motivation

A diagnosis made in 2019 found out that 75% of 1st year students, 45% of 2nd year students and 30% of 3rd year students did not reach the minimum level of expected learning, which discouraged them from attending the school. It was also found that the students had poor study and hygiene habits, and that they did not interact in a healthy manner.

Sequence

For the purpose of strengthening the sense of belonging to the school, a uniform was introduced in 2019 to identify the students, and a major sporting event was organized with the participation of members of others Associated Schools (CEA) in the area and of the General Directorate of Vocational and Technical Education (UTU) of Paso Molino.

In 2020, the school worked on an institutional project aimed at strengthening student bonding and a sense of belonging in a context of blended coexistence marked by the pandemic.

In 2021, the "Yo y mi centro" project was carried out with a focus on each person recognizing themselves both in their inner self and in their school. The project was later adapted into "Yo en mi centro virtual" in order to suit conditions during the pandemic.

A new step in this learning process was the NODO award-winning project from 2022 "Learning in order to Really Learn", which aimed to encourage students to make sense of what they learn and continue to study after the end of their formal education period. The project was based on disciplinary work in the context of interdisciplinary trajectories aimed at solving the problems of daily life. It also aimed to strengthen the different dimensions of "character" as a skill, especially the attitudes of self-improvement and resilience in the face of difficulties related to curricular learning and socialization. Another objective was to consolidate the "collaboration" skill by promoting interdependent work, overcoming challenges and making tough decisions using a group and comprehensive approach to the learning processes.

Strengths of the Innovation

- **Distributed leadership and collaborative work**: The coordinators show the way and set out clear institutional guidelines while enabling spaces for participation and professional development based on the students' needs and their team's interests.
- **Students at the centre as subjects and leaders of their learning processes**: The rubrics are usually presented with a broad scope to let them be the ones that choose the path that motivates them the most, in keeping with the stated objectives.
- **Project-based work and learning by doing**: Projects arise from problems and concerns, and the students explore the best solutions to each of them, as was the case with two of the school's most significant experiences: the project on conditioning the car park and the "Techos vivos" project, both led by the Technology Workshop.
- **Mainstreaming technology and tools for scientific work**: The hard work of the coordinators and the school's participation in contests and activities related to the application of technological tools in teaching and learning science earned the school various resources that students use on a daily basis.

- **Focus on learning processes**: Although the assessment of learning comes across as a point to be strengthened, there is an open attitude to the incorporation of strategies that enhance the processes of each student.
- **Family involvement**: Gradual but sustained work as a result of the education community's unwavering willingness to listen. In addition, some of the families are actively involved in a powerful development committee.

Main challenges

Due to the culture of reflection and lifelong learning that characterizes this school, its stakeholders identify the following as the most important challenges for the future:

- Achieve sustainability of pedagogical innovation. Generate activities that impact on students so that they continue to motivate themselves and remain in the educational system.
- Getting more teachers to join the interdisciplinary and project work.
- A closer relationship with the students, especially the newcomers.
- Making sure that teacher turnover (regardless of the recognized stability of three-quarters of the staff) will not affect the students' work processes.

Key points of the innovation according to those involved

Pedagogical leadership

"[The coordinator] is the prime mover of this school, and her leadership is 100% collaborative and distributed, with her leading the way but finding the strengths of her team, her teaching staff, as a means of facilitating student processes." Julia Larrosa, Global Learning Network mentor.

A stable, committed, collaborative professional community

"I've had the same workmates for three years. There are lots of teachers who keep choosing this school. They take project work seriously, as a team, and that's something you don't see anywhere else." Florencia Tzitzios, Health and Sexuality workshop leader.

Work aimed at addressing and solving everyday issues

"It's not just about complying with a syllabus. It's about making sense of everything they learn and seeing that they can make use of it, that they can relate it, that it is applicable to their daily lives." Florencia Apelo, mathematics teacher.

"We want the kids to identify a real problem in which they can apply the tools we have or the knowledge that we provide them," Eduardo López, technology teacher.

Student-centredness, motivation for learning and a safe environment

"We seek to relate the things we work on to the students' interests. We try to work out the meaning of what is being learnt. We take student-centredness very seriously, and we all work towards it." Florencia Apelo, mathematics teacher.

"I can't have an unvarying plan because I know I'll have to adapt it. It's necessary to be ready for contingencies and not to overlook certain needs." Florencia Tzitzios, Health and Sexuality workshop leader.

Use of technology

"The school is very technologically advanced. In Biology there is a lot of material and equipment, digital microscopes that come from the Ceilab Sciences Programme which we use all the time, and we work out how to learn with technology. We always try to find something new to help us learn better." Helen Rodríguez, 9th grade student.

Relationship with family leaders

"The educational center understands that the family-educational center alliance generates responsibility and commitment in the students, so actions are planned and coordinated to carry out the design and co-design of the processes together with the families," Gabriela Silvera, CEA coordinator.

Networking at the territorial level

"This is a networking school connected to the Carrasco Norte network, the municipality, schools, ASSE (State Health Services Administration), youth centres, pedagogical clinics. We have direct contact and set up partnerships. We deal with situations that the kids in the neighbourhood worry about, such as teen suicide prevention, sometimes insecurity, drug use; whatever is a concern for the neighbourhood," Gabriela Silvera, CEA coordinator.

Technological resources used

- Ceilab Programme: 3D printers, drones, sensors, micro:bit boards, Arduino, Globilab sensors, robotics kit, digital microscope, digital magnifying glasses. https://ceilab.ceibal.edu.uy/
- CREA Platform. https://ceibal.edu.uy/plataformas-y-programas/crea/
- Google Drive: a file storage system with associated collaboration capabilities at different levels (viewer, commenter, editor). Personal Cloud Storage & File Sharing Platform - Google
- Google Forms: allows the user to design and distribute questionnaires for the collection and analysis of information; associated collaboration capabilities at different levels (viewer, commenter, editor). Google Forms: solution for creating online forms | Google Workspace
- Google Meet: videoconferencing platform. https://workspace.google.com/intl/es-419_ar/lp/meet/
- Kahoot: allows the user to devise tests and assessment questionnaires in a recreational format. Kahoot! | Learning games | Make learning awesome!
- Mentimeter: allows the user to create interactive presentations and meetings with real-time feedback. https://www.mentimeter.com/es-ES
- Zoom: videoconferencing platform. https://zoom.us/es
- Scratch: straightforward programming language that uses blocks to allow the user to create interactive stories, games, animations, among other projects. Scratch - Imagine, Program, Share (mit.edu)
- Canva: a tool for the design and publication of documents in various formats such as presentations, videos, brochures, banners, etc; collaboration capabilities. About Canva
- Poster My Wall – Platform for creating social media graphics, videos, brochures and email campaigns. https://es.postermywall.com/
- Genially: a tool for creating interactive content. https://genial.ly/es/

Voices of the education community

Delfina Silveira Cruz, 9th grade student

> Teachers look at how we work, but each of us keeps an eye on the progress we are making. There is no comparison among students, the idea is to see your own progress.

Adolfo Zampetti, biology teacher in 2022 and workshop leader in 2023

> You are getting real-time feedback from the student. You see whether they understand, whether they are using the tools well, whether they take the measurements correctly, whether they are integrated. It's on-site feedback that makes it easier to assess, although subsequent registering is more complex. In a lecture, you don't know whether the student understands.

Helen Rodríguez, 9th grade student

"I was in the parking project, where we found a real problem: not all the teachers' cars could fit. We located each segment for the cars, where each one had a place, and so we were able to go from having four cars entering to having seven more. This represented an innovation for me and I liked being able to help my center."

Gabriela Silvera, coordinator since 2018

"Innovation in this educational center is present in collaborative work among teachers, in project-based learning, in students' voices, who are heard and whose interests are being attended and in technology which occupies a crucial role for all the subjects."

Julia Larrosa, Global Learning Network mentor since 2022.

> [To innovate,] it's necessary to be convinced that there are other ways of teaching and learning, and that you can then rely on institutions, companies and organizations that promote pedagogical innovation. A collaborative culture is key: innovating implies the school keeping its doors open so that learning can come and go.

Skills-Based Work:

BACKPACK CIT

Fray Marcos Secondary School, Florida

Skills-Based Work:

BACKPACK CIT

Fray Marcos Secondary School in Florida won the NODO 2022 award in the Skills-Based Work category for the "Backpack CIT" project. The experience involves students visiting primary schools in the school's area of influence to put forward various proposals related to physics, chemistry, English, technology and computer science.

The name of the project is a reference to a "backpack of tools" for Science, English and Technology (CIT: Spanish acronym for **C**iencias, **I**nglés y **T**ecnología) that helps promote and transfer comprehensive learning to multiple destinations. The aim is to strengthen skills such as communication, collaboration, creativity, character, citizenship and critical thinking among its students and promote primary schoolchildren's transition to secondary education. It is innovative in that it is a break with traditional models of grouping and school time, as well as with geographical barriers and the generation gap. The selection of topics is based on the interests and needs suggested by the primary schools themselves.

Characteristics **of the school**

Located in Fray Marcos, a town with an estimated 2,400 inhabitants in the southeast of the department of Florida, this secondary school belongs to the General Directorate of Secondary Education. It was founded in 1984 as a result of the need for a school of this nature in the area. It opened in 1989 as an annexe to the secondary school in the neighbouring city of Tala, Canelones, and in 1998 it was established as Fray Marcos Secondary School on its own premises, where it still operates today.

The school is attended by 131 Lower Secondary Education students and 97 Upper Secondary Education students on the morning and afternoon shifts respectively. It is the only secondary education facility in the town, so it brings together students from very heterogeneous backgrounds, including rural areas.

The school's team is made up of the principal, one secretary, two teacher assistants, two administrative clerks, three auxiliaries, one laboratory assistant, one Bibliographic Guiding Teacher, two IT and Educational Technology Guiding Teachers (Spanish acronym: POITE), and 39 other teachers. There is strong stability and commitment to the school at both the management and teaching staff level. More than 60% of the teachers have been working for at least five years.

The school works hard on inclusion with the support of the Mandela Network, which comprises fifteen Secondary Education and UTU schools which include adolescents with various disability issues in the regular education system. In this regard, efforts are made to draw attention to the students' different identities, needs and trajectories in their educational environments and break down the barriers that prevent them from exercising their right to education. The school also encourages an interest in innovation, supported by the tools and spaces for reflection proposed by the Global Learning Network. It is an open-door school and an influential centre for the community that has developed a strong bond with the schools in the area.

Characteristics **of the project**

Motivation

With the aim of supporting the students through this learning stage and to make the educational transition as pleasant as possible, some initiatives were promoted beforehand for early familiarization between primary schoolchildren and this secondary school, such as a project called "Con un pie en el liceo" (One foot in secondary school). In this context, an assignment was proposed for promoting ties with some of the primary schools in the area.

At the same time, the institution identified the need to strengthen students in the "Communication" skill, since they seemed to have trouble explaining the projects they had carried out.

Sequence

The "Backpack CIT" project took an estimated four years to develop with three fundamental pillars supporting it: the development of empathetic ties with the primary schools, the motivation and leading role of the students, and the commitment of the teachers that are there for them in curricular and extracurricular spaces.

In a very organic way, a team of teachers was consolidated in the area of computer science who tested new ways to be closer to primary schools. Knowledge was shared through recreational proposals with the students in a leading role, which allowed them to strengthen their communication skills. Some projects in this vein were "Roboteando el pago", and "Scratcheando", which were carried out in 2019.

English was incorporated on account of the needs that the students identified in their environment in the context of the 2019 National Student Forum, promoted by the Global Learning Network.

Finally, the incorporation of sciences came as a result of the needs the schools themselves said they had. A scenario where students could share concepts, instruments and experiments was seen as an opportunity to bring science to rural primary schools, which in many cases did not have the resources to carry out this kind of activities.

Strengths of the Innovation

- **Pedagogical leadership:** The principal is instrumental in coordinating activities, transporting the students to the primary schools and being there for them. All of this involves challenging logistics, since most primary schools are located several kilometres from Fray Marcos, which means costs and time, in addition to having to coordinate and respect the dynamics of each institution and its curricular and extracurricular activities.

- **Autonomous and collaborative work**: Once the specific topic has been defined, it is the students who are in charge of researching and planning the activity either in the workshop spaces or in a self-managed way, coordinating and meeting outside school hours with the support of some of the teachers involved.

- **Circulation of technological resources and diversity of the experiences shared with primary schools**: A number of resources were used to support the shared experiences, which is essential in rural primary schools, where they are rarely available for work with the students. Examples: learning English through memory games available on the Ceibal platform, the use of scientific instruments to measure the PH and humidity of soil, experiments to detect the presence of proteins in an egg, operating drones, programming micro:bit and Lego blocks, among other activities.

- **Building an empathetic relationship between schools**: As the students share their projects with the primary schools, they feel the affection and interest with which they are welcomed by the students and teachers of the primary schools they visit.

Main challenges

The main challenge of the proposal is the cost and organization of transport, which is taken care of by the teachers involved using their private vehicles.

The time it takes to carry out the activities, since all the people involved participate as volunteers and outside school hours.

It is necessary to involve more teachers and students in the project and bring in other areas such as Arts and Crafts.

Key points of the innovation according to those involved

A Project born from students and primary schools needs

"It came from the students, from their interests. It wasn't us the teachers that sat down to prepare a project: it was just the other way around." Ana Celia Vignoli, english teacher since 2013.

The principal's leadership

"The principal listens to you when you bring ideas, says yes to everything, promotes distributed leadership, and delegates." Carina Rosas, computer science teacher since 2008.

"Interdisciplinary work. Being able to coordinate any kind of activity. Having the institution's support." Gabriela Pérez, chemistry and physical sciences teacher since 2008.

Commitment of the leading teachers

"The undertaking involves hard work by the teachers carrying it out and by the students. It's based on the effort put in by each of them, and that's why the factors that stand out are commitment and service." Graciela Barreto, principal of the school since 2008.

Student Engagement and Participation

"We show the teachers what we want to teach the children from the primary schools, and they almost always agree," Gerónimo Martínez, 4th year student, upper secondary education.

"You can see how committed to the task they are, how they care about the materials. It's incredible how they organize themselves and work almost autonomously. You kind of have to keep your hands tied." Isolina Hernández, computer science teacher and IT and Educational Technology Guiding Teacher (POITE) since 2015.

The families' support

"The families are an invaluable asset to the project. They are authorizing a child to travel many kilometres on country lanes to some activity that will not earn them a mark." Graciela Barreto, principal of the school since 2008.

Technological **resources and scientific instruments**

- Scratch: straightforward programming language that uses blocks to allow the user to create interactive stories, games, animations, among other projects. Scratch - Imagine, Program, Share (mit.edu)
- Ceibal Platform for learning English. https://ingles.ceibal.edu.uy/
- Ceilab Programme: drones, micro:bit boards, Labdisc-Globilab sensors (wireless science laboratory with 15 sensors that enables more in-depth analysis and presentation of data in real time through the free GlobiLab software). https://ceilab.ceibal.edu.uy/
- Droneblocks: platform for learning with a focus on STEM through programming and real-world application of drones, robots and sensors. https://droneblocks.io/
- Mindstorm EV3 Programmer: the official app for programming LEGO robots in a simple and fun way. https://www.lego.com/es-us/themes/mindstorms/learntoprogram
- Makecode Environment: Free, open-source platform for creating engaging IT learning experiences that help support a progression path into real-world programming. https://www.microsoft.com/es-es/makecode/about
- Canva: a tool for the design and publication of documents in various formats such as presentations, videos, brochures, banners, etc; collaboration capabilities. About Canva
- Blogger: a tool for creating unique and beautiful blogs https://www.blogger.com/
- British Council: Public cultural British organization specializing in disseminating knowledge of the English language and its culture through training and other educational activities. https://www.britishcouncil.uy/ingles/websites

Voices of the education community

Rosario Ramírez, principal of La Escobilla Primary Rural School N°.15

> It has been quite an innovation for us because it has helped us in learning of the kids; has motivated children to obtain new knowledge.

Graciela Barreto, principal of the Fray Marcos Secondary School since 2008

> It has been enriching and pleasant to go along with them, to get to the primary school, to see the children happily welcoming the secondary school students, who are happy themselves to do what they are doing, and then hear them on the way back speaking like teachers: what they did wrong, how they can improve their planning next time, what they forgot to say or do. It's lovely for those of us working in education.

Carina Rosas, Communication Sciences teacher and IT and Educational Technology Guiding Teacher (POITE) ar Fray Marcos Secondary School since 2018

> The students were working on programming and started talking about teaching it. First, they taught it in the classrooms, as part of the *Teacher for a Day* project. They taught their classmates, and then the idea emerged of taking them to other places and strengthening the ties with rural primary schools. Later on, other areas joined in: sciences with the topic of sensors, robotics, drones, and finally micro:bit. We tried to incorporate everything that came to the school.

Ignacio Juárez, 4th grade student at Fray Marcos Secondary School

> Backpack CIT went to my school a few years ago, when I was in 3rd grade and they taught me what Scratch was and programming. Afterwards it was my turn to go to other schools. Thank you to this, one of my options for the future is programming.

Marianna Molinari, 9th grade student at Fray Marcos Secondary School

> Making a presentation in front of a class helps you a lot. For instance, I've had trouble talking and explaining things since I was little, and this has helped me a lot.

Valentino Dzlczer, a 5th grade student at La Escobilla Rural Primary School N°.15.

> I learned about microbits, about how to program them, about how to handle drones and all that kind of stuff.

The Public's Recognition:

APP AMIGOL5

Secondary School No. 5, Salto

The Public's Recognition:

APP AMIGOL5

Secondary School Nº5 in the city of Salto won the NODO 2022 award in the *The Public's Recognition* category for "Aplicación AmigoL5". This project developed an application that allows the user to overcome communication barriers between the deaf and the non-deaf in the school through the implementation of active learning methodologies. Based on a process of inquiry into deaf culture and the degree of command of the Uruguayan Sign Language by the different institutional stakeholders, a free application was developed for mobile phones with the Android operating system. It shows in video format the sign corresponding to the word that a non-deaf person speaks into the microphone. The database of the app has over 250 words.

Characteristics of the school

Secondary School Nº5 is located in downtown Salto, in the department of the same name, 498 kilometres from Montevideo. It belongs to the General Directorate of Secondary Education, which provides Integrated Lower Secondary Education (7th, 8th and 9th grade) and 4th year of Upper Secondary Education. It is the first secondary education school outside Montevideo in the country. It has been operating since 1889. It has a long track record as a school, and is a leading institution for the deaf in the area, who receive the support of interpreters in all subjects. It is closely coordinated with the School for the Deaf No. 116 and *CERESO* (Spanish acronym for Resource Centre for Deaf Students).

Its original building – declared a national historic landmark in 1991 – is in an Art Nouveau style that is structured around a large central courtyard with a gallery, and has had successive extensions over the years. It also has a mural painted by Uruguayan artist Carlos Páez Vilaró in 1963.

It is a three-shift secondary school, so there is a large staff made up of one principal, two deputy principals, twelve teacher assistants, two secretaries, one administration clerk and one intern. It has a 243-strong teaching staff (199 on the first two shifts), of whom an estimated 80% have been working at the school for over 5 years, which contributes to institutional solidity despite its size.

It is the only school in the country that has integrated an inclusive education department on which subcultures converge. Cross-cutting work is also carried out for the inclusion of diversity beyond hearing-impaired students, since about 160 pupils have some disability or learning difficulty, in many cases associated with autism spectrum disorder. The school is attended daily by a total of 1,155 students who come from different parts of the city and the department. Between 4 and 6 groups per level operate on the morning and afternoon shifts, and two groups per level on the night shift.

Characteristics **of the project**

Motivation

As part of the Robotics and Programming workshops, whose objective was to come up with digital solutions to specific problems of daily life, a survey of the high school context and the resources available was undertaken in 2019. As regards the profile of the school, characterized by having deaf students, the survey identified communication barriers, which resulted in the idea of developing an application for everyone to learn sign language.

Sequence

In 2019, the possibility of developing an application to teach everyone sign language led the Robotics and Programming workshops to coordinate with an interpreter, who contributed her knowledge of the language and deaf culture. The decision was made to work on expressions which the application sourced from

a database and turned into a video with the corresponding sign. A list was made of the most significant signs in everyday use, and the deaf students who participated in this stage of the project recorded them. This produced a prototype that stalled due to difficulties with the free technical tools available.

After finding a solution to the technical problems, the project was resumed in 2021 under the coordination of the same teacher with another IT group. All the students of that level were involved, organized in work teams that took care of the different activities required: programming, designing, shooting videos, editing, converting files, organizing them and loading them into the storage resources, etc.

The students worked in a self-managed fashion with the monitoring and support of the teacher. They used computers to program and their mobile phones to make the videos. For the shoots, a set was put up with an orange background (the colour representing the deaf community) and a tripod.

The app was designed using App Inventor. 250 videos were shot and then converted to GIFs, stored in Google Drive, and hosted on two free servers.

Feedback was requested from the teachers and students of School for the Deaf No. 116, who requested the inclusion of new expressions. The app was tested for various Android devices and submitted for Google Play validation.

A major effort was made to disseminate the initiative in the school and the mass media, with the participation of a leading student group. The app was declared of departmental interest by the Local Government of The Department of Salto in December 2021.

Strengths of the Innovation

- **Collaborative work:** At the level of students (deaf and non-deaf) and management team, teachers and interpreter, and consolidation of post-pandemic ties.
- **Strengthening the school's identity**: As a leading institution for deaf students; appreciation of the deaf community in Salto.
- **Promotion of significant and meaningful learning**: Based on the resolution of contextualized and everyday problems; development of digital citizenship.
- **Contribution to breaking down communication barriers**: Through a free, open-access, country-wide tool.

Main challenges

- Adding more words and a sentence-building feature to the application.
- Access to resources to get paid tools that will ensure the operation of the app and mass download.
- Continuing to work on the maintenance and improvement of the app even though two of the teachers leading the project no longer work at the school and the students who participated in the second version will graduate in 2023.

Key points of the innovation according to those involved

Focus on the school's context and the students' interests

"It was the students who said they wanted to communicate with their classmates and went to the teacher for a solution." Gabriela Moreira, history teacher and deputy principal between 2014 and 2022.

Development of digital solutions to everyday problems

"The first thing was an analysis of the school's context and the available resources, and thinking about what we could do with the tools we had. We analyzed the school's profile, which is characterized by having deaf students, and the idea was put forward of developing an app so that everyone could learn sign language." Eduardo Cantos, former IT and Educational Technology Guiding Teacher (POITE) and IT teacher.

Comprehensive, interdisciplinary approach

"Many areas and hubs were covered which have to do with IT itself. That is, the purpose was to use different technological tools to come up with a new digital solution." Eduardo Cantos, former POITE and IT teacher.

"The process allowed the students to learn Spanish language, IT and other subjects, in addition to deaf culture, and the team of teachers that supported the initiative worked on a sequence in such a way that we would all learn from each other." Gabriela Rochón, former Spanish language teacher.

Collaborative, active, and self-managed learning

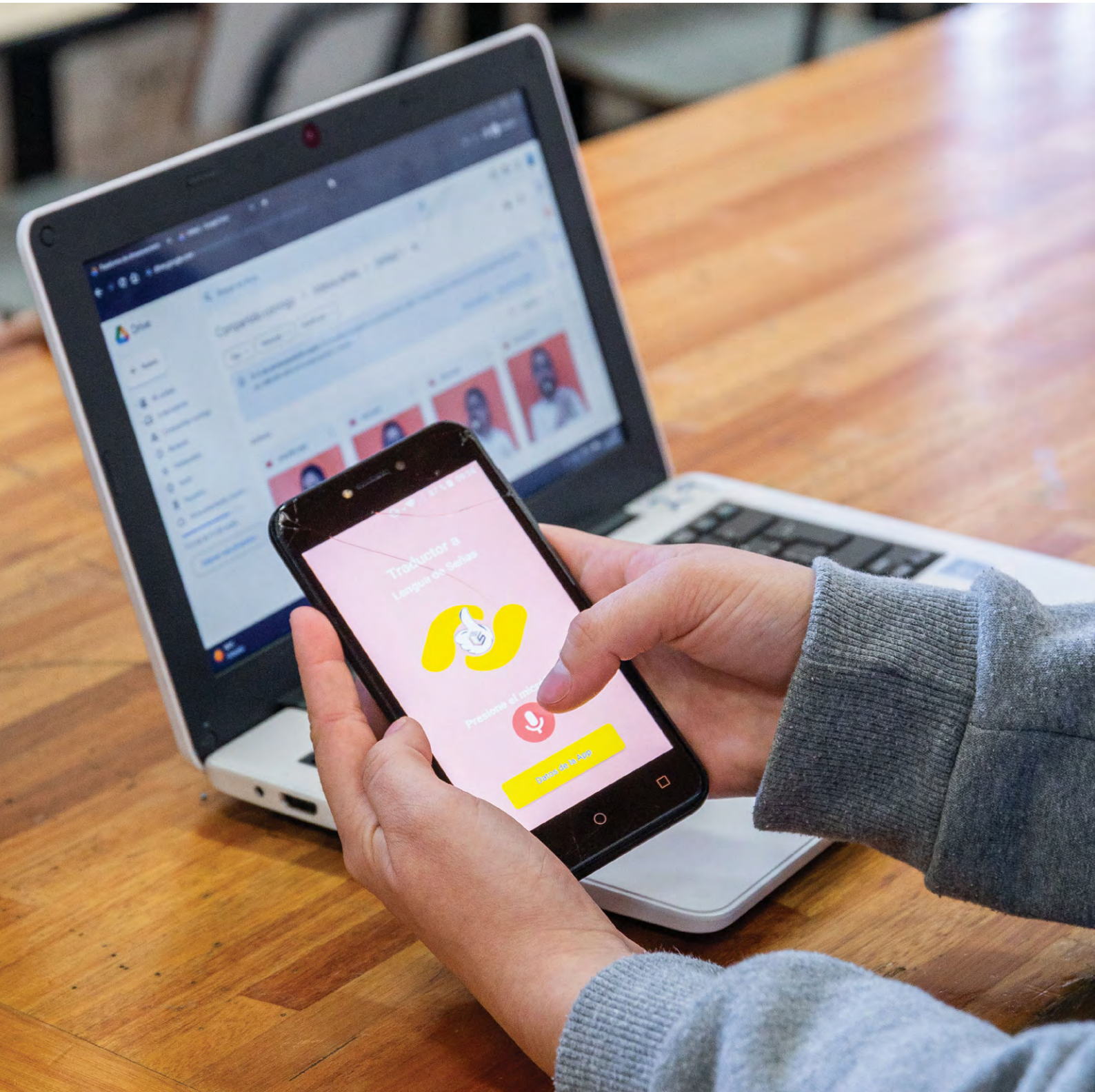
"There were a couple of weeks when the students worked on their own. I'd just make specific interventions." Eduardo Cantos, former POITE and IT teacher.

"We had to learn design and programming, and use that to develop the app, and then it was all clearer to us." Benjamín Volpi, 4th grade student.

Strengthening inclusion

"I think we've paved the way for communication to be less hard when other deaf students join the school. And I think that's great for the future." Kimberly Rodríguez, deaf student who graduated from the school in 2021.

"I'm proud of the work we did, that it was work shared with hearing people, that we can disseminate it." Tatiana Sosa, deaf student who graduated from the school in 2021.



Technological **resources used**

- Canva: a tool for the design and publication of documents in various formats such as presentations, videos, brochures, banners, etc; collaboration capabilities. About Canva
- OpenShot: free cross-platform non-linear video editing software. https://www.openshot.org/es/
- App Inventor: platform for developing applications for the Android operating system. https://appinventor.mit.edu/
- Google Drive: a file storage system with associated collaboration capabilities at different levels (viewer, commenter, editor). Personal Cloud Storage & File Sharing Platform - Google
- Google Forms: allows the user to design and distribute questionnaires for the collection and analysis of information; associated collaboration capabilities at different levels (viewer, commenter, editor). Google Forms: a solution for creating online forms | Google Workspace

Voices of the education community

Tatiana Sosa, student who graduated from the school in 2021.

> All of us in the deaf group used to be classmates in primary school. Later, in 1st year of secondary school, everything was new to us: we didn't know anyone and we were faced with another reality. We felt very bad. It was hard to learn and a little confusing too. We met the IT teacher there, who suggested that all of us, the deaf and the non-deaf, should think of how to deal with the communication barriers.

Guadalupe Pereyra, student who participated in the development of the application

> First it was a project to do something different but as we had a lot of progress and we saw it going progressing very well we decided to do something much bigger.

Camila Pérez, sign language interpreter since 2014.

> The mother tongue of the deaf is sign language, and Spanish is their second language, but the grammar is different. They find Spanish very complex; they have to rely on memory to learn it. Besides, here in Salto they go to the school for the deaf, where things are taught in sign language and they have deaf instructors, but when they get to secondary school, it's all in Spanish.

Jorge Buslón, principal since 1999.

> The objective of the first stage was the attendance of the deaf students, and then their inclusion. The school had to adapt, so we worked together with the Resource Centre for Deaf Students (Spanish acronym: CERESO) of the General Directorate of Secondary Education. A three-month training course was offered to the entire management team, teacher assistants, laboratory assistants, teachers and the deaf students themselves. It was then that we found out that 80% of the students' parents didn't know sign language.

Gabriela Moreira, history teacher and deputy principal between 2014 and 2022.

> It was an application that touched the hearts of many, a delicious experience for students. Because not only did they learn to work from the methodological point of view with problem solving but also, and above all, with the human part: working as a team and value the other.

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